USB Type-C ENGINEERING CHANGE NOTICE

Title: USB4 VCONN at U-CL States
Applied to: USB Type-C Specification Release 2.0, August 2019

Brief description of the functional changes proposed:
Define for active cable in USB4 maximum allowed power consumption in different CL power states. Update maximum power consumption for USB3.2.

Benefits as a result of the proposed changes:
Clarify the maximum allowed power consumption by active cable through different CL state. Relaxes power consumption for USB3.2 with more achieveable power numbers.

An assessment of the impact to the existing revision and systems that currently conform to the USB specification:
No clear definition for this before, as far as know all design meet this limitation.

An analysis of the hardware implications:
No implication assume implementation meet the target.

An analysis of the software implications:
No implication

An analysis of the compliance testing implications:
Will need to define test to measure active cable does not consume more power then allowed in respective power states.

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Actual Change Requested

(a). Section X.X.X, Table/Figure X-XX (if applicable), Page X-XX

From Text:

6.4.4 VCONN Requirements

Active Cables shall:

- Meet the VCONN sink requirement defined in Table 4-6 and Table 6-19.
- Connect VCONN as shown in Figure 2-1 or Figure 2-2.

  Short Active Cables shall be capable of being powered from VCONN from only one port. OIAC shall be powered from VCONN from each port.

6.6.4.4 USB 3.2 U-State Power Requirements

Active cables shall meet the VCONN power requirements in Table 6-19. These requirements are for the entire cable not just a cable plug.

Table 6-19 USB 3.2 U-State Requirements

State	Maximum Power Consumption VCONN	Target Power Consumption VCONN	Power Consumption Notes
U0	1.0 W single-lane 1.5 W dual-lane		Applies to POLLING.LFPS, TRAINING, and RECOVERY states.
U1	≤ U0 power		Forwarding LFPS is required
U2	≤ U1 power		Forwarding LFPS is required
U3	5 mW	2 mW	eMarker in sleep.
Rx.Detect	5 mW	2 mW	Rx.Detect period may be lengthened when no USB 3.2 terminations have been detected. eMarker in sleep.
eSS.Disabled	5 mW	1 mW	USB 3.2 is disabled. eMarker in sleep.

Note: Ra must be completely removed or very high impedance to meet the power requirements in U3, Rx.Detect, and eSS.Disabled.

To Text:

6.4.4 VCONN Requirements

Active Cables shall:

- Meet the VCONN sink requirement defined in Table 4-6 , Table 6-XX and Table 6-XY.
- Connect VCONN as shown in Figure 2-1 or Figure 2-2.

Short Active Cables shall be capable of being powered from VCONN from only one port. OIAC shall be powered from VCONN from each port.

Replace section 6.6.4.4 with the below

6.6.4.4.1 USB U/CLl-State Power Requirements

Active cables shall meet the VCONN power requirements in Table 6-XX and Table 6-XY. These requirements are for the entire cable not just a cable plug.

Table 6-XX USB 3.2 U-State Requirements

State	Maximum Power Consumption VCONN	Power Consumption Notes
U0	1.0 W single-lane 1.5 W dual-lane	Applies to POLLING.LFPS, TRAINING, and RECOVERY states.
U1	≤ U0 power	Forwarding LFPS is required
U2	≤ U1 power	Forwarding LFPS is required
U3	20 mW	Steady state power. eMarker in sleep.
Rx.Detect	20 mW	Rx.Detect period may be lengthened when no USB 3.2 terminations have been detected. eMarker in sleep.
eSS.Disabled	20 mW	USB 3.2 is disabled. eMarker in sleep.

Note: U3/Rx.Detect/eSS.Disabled Power requirements are not applicable to OIAC cables.

Table 6-XY USB4 CL-State Requirements

State	Maximum Power Consumption VCONN	Power Consumption Notes
CL0	1.5 W	Applies to all training states and CL0.
CL0s	≤ CL0 power	
CL1	≤ CL0 power	
CL2	≤ CL1 power	
CLd	20 mW	Steady state power

Note: CLd Power requirement are not applicable to OIAC cables.